A NEW SPECIES OF ELYTRARIA (ACANTHACEÆ) OCCURRING IN EAST AFRICA

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Dokosi, O. B. — 30.04.1979. A new species of Elytraria (Acanthaceæ) occurring in East Africa, *Adansonia*, ser. 2, 18 (4) : 433-441. Paris. ISSN 0001-804X.

Abstract : Five species of *Elytraria* have been known to occur in Africa. These are *E. marginata* Vahl, *E. maritima* J. K. Morton, *E. ivorensis* Dokosi, *E. lyrata* Vahl and *E. acaulis* (L. f.) Lindau. A new species *E. minor* Dokosi which is the subject of this paper has been recorded from Kenya and Tanzania in East Africa. This new species closely resembles *E. lyrata* Vahl in being acaulous and possessing lyrate leaves, but the leaves of the former are smaller and bullate; the terminal lobe which is suborbicular is 3-4-nerved. There are also differences in inflorescence structure. The breeding relationship between this species and four other species has been investigated and the results stated.

Résumé : Jusqu'à maintenant, 5 espèces d'*Elytraria* étaient connues d'Afrique : *E. marginata* Vahl, *E. maritima* J.K. Morton, *E. ivorensis* Dokosi, *E. lyrata* Vahl et *E. acaulis* (L. f.) Lindau. *E. minor* Dokosi, nouvelle espèce est-africaine du Kenya et de Tanzanie, fait l'objet de ce travail. Acaule, elle est également très affine de *E. lyrata* par la forme de ses feuilles qui cependant sont plus petites et gaufrées; le lobe terminal, suborbiculaire, possède 3-4 nervures. Il existe aussi quelques différences dans la structure inflorescentielle. Les rapports entre *E. minor* et les quatre autres espèces sont également précisés.

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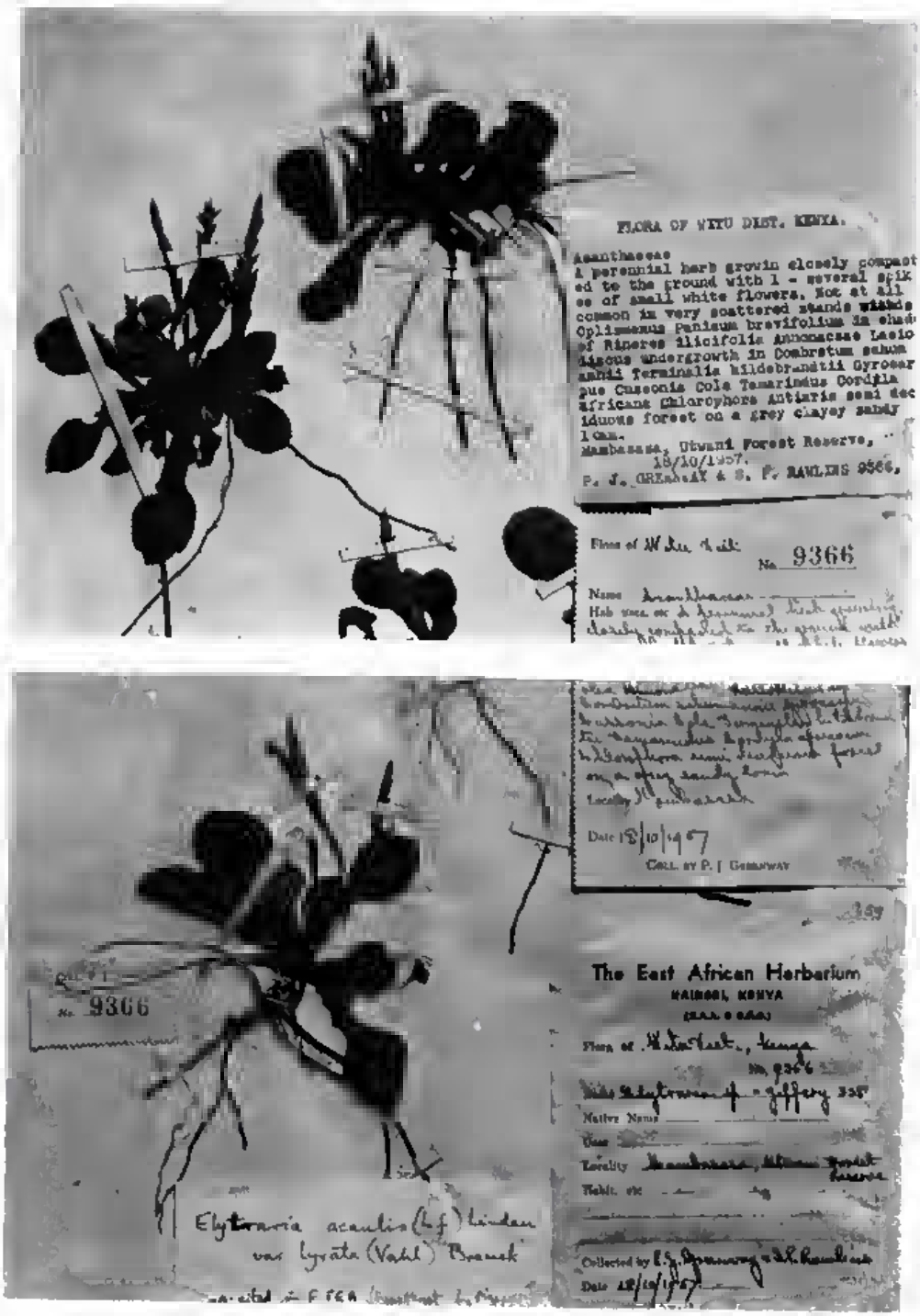
Elytraria minor Dokosi, *sp. nov.*

E. lyratæ Vahl *affinis, sed foliis minoribus bullatis, lobo terminali suborbiculari, inflorescentiis brevioribus raro ramosis, capsulis bracteas valde superantibus seminibus paucioribus majoribus, satis differt.*

Herba acaulis, perennis; folia omnia basalia, (30-) 50 (-65) mm longa, (10-) 15-20 (-25) mm lata, bullata, lyrata, lobis non profundis, lobo terminali subarbiculari, utrinque 3-4-nervi; pagina foliorum sparse ciliata subtus glabrata supra sparsissime pubescens, costa nervisque subtus pubescentibus, costa supra pubescenti; petiolus villosus; inflorescentiæ 5-10 terminales et axillares, 30-50 (-80) mm longæ, simplices vel raro cum ramis solitariis, glabratæ; bracteæ purpurascentes, cymbiformes, ovatæ, 4-5 mm longæ, 1.5-2 mm latæ, margine scariosa ciliata; bracteolæ binæ cymbiformes anguste ovatæ; calycis lobi 5 elliptici, posterior 4 × 1.5 mm, laterales anterioresque 4 × 0.75 mm; corolla 8-9 mm longa; capsula purpurascens 6.5-7 mm longa, 1-1.5 mm diametro; semina 0.5-0.7 mm diametro, 15-17 per capsulam.

Habitat in Africa orientali ad humum in sylvis.

Typus : *Greenway & Rawlins 9366*, Kenya (holo-, EA; iso-, K).



Pl. 1. — **Elytraria minor** Dokosi : Holotype (*Greenway & Rawling 9366*).

Fig. 2. — **Elytrarya minor** Dokosi, grown at the University of Ghana Botanical Garden.

Elytraria minor Dokosi closely resembles *E. lyrata* Vahl in being acaulous and possessing lyrate leaves; but differs from it in having smaller bullate leaves; the terminal lobe is suborbicular and 3-4-veined; the inflorescences, terminal and axillary, are shorter than those of *E. lyrata* Vahl, solitary or rarely 1-branched, spreading; bracts and capsule purplish.

E. minor Dokosi resembles *E. maritima* J. K. Morton in possessing short spreading inflorescences, in the smaller number of seeds per capsule (20-25) and in its relatively large seeds.

The new species is distributed mainly in the forest regions of Kenya and Tanzania, where *E. lyrata* also occurs.

The seeds of *E. minor* were sent to me by J. C. Bowling from Kew Botanical Garden. They were collected from a species of *Elytraria* being grown there and labelled « from East Africa ». This new species was raised from these seeds in the Department of Botany, University of Ghana, Legon, *Dokosi & Botokro GC 44901, GC 44902, GC 44903, GC 44904, GC 44905, GC 44906, GC 44907, GC 44908.* It was grown side by side with the other three species previously described (Dokosi, 1971). Attempts to hybridize *Elytraria minor* with *E. marginata* Vahl, *E. maritima* J. K. Morton and *E. ivorensis* Dokosi were not successful, but sterile F_1 hybrids (*Dokosi & Botokro GC 44909, GC 44910, GC 44911, GC 44912, GC 44913, GC 44914, GC 44915, GC 44916*) were obtained with *E. lyrata* Vahl; their anthers produced bad pollen. Details of hybridization experiments were

Fig. 3. — **Elytrarya lyrata** Vahl, grown at the University of Ghana Botanical Garden.

described in a previous paper (DOKOSI, 1971). Each species has, during this period, maintained its distinctive characters. *E. lyrata* Vahl and *E. minor* Dokosi also produced sterile hybrids spontaneously during this period.

CHARACTERS OF F_1 HYBRIDS

In those cases in which pollen from *E. lyrata* Vahl was placed on the stigma of *E. minor*, the F_1 hybrids could be distinguished from the maternal parent by their large, long leaves and long-branched sterile inflorescences. In the reciprocal crossing experiments, the F_1 hybrids showed darker leaves with more or less orbicular terminal lobes, 3-4-nerved; the inflo-

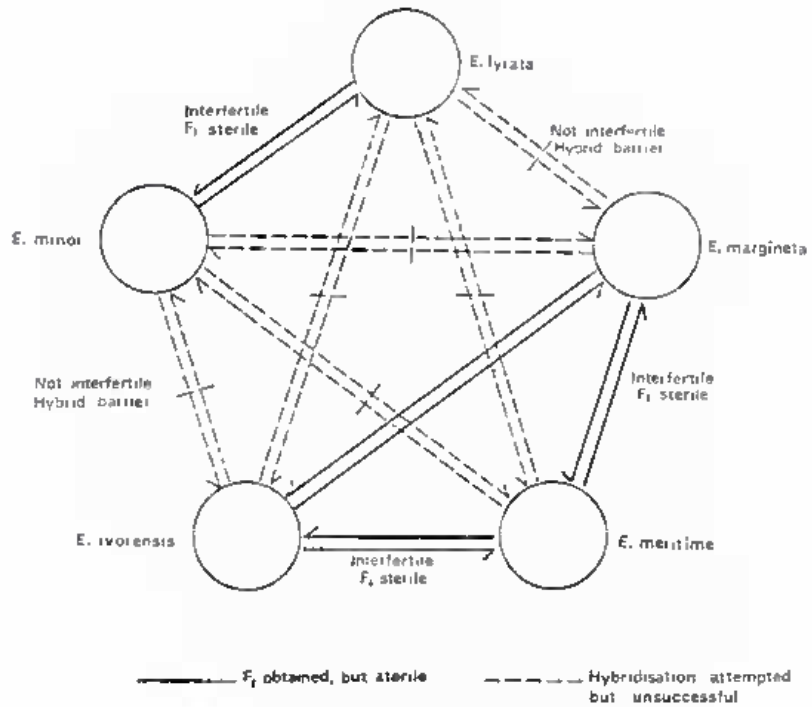


Fig. 4. — Hybridisation in **Elytraria** spp.

rescences were sterile and purplish. The F_1 hybrids can therefore be distinguished from their parents both in live plants and on herbarium sheets, but better in live plants. In general, it has been observed that 100 % hybrids are not obtained in hybridization experiments because a certain degree of self-pollination takes place.

None of the *Elytraria* under investigation is cleistogamous. Their flowers open between 5 and 6 a.m. and close between 9 and 10 a.m. In a previous paper (Dokosi, 1971) it was observed that those of the other species of *Elytraria* open between 5 and 6 a.m. and close at noon.

MEASUREMENT OF LEAF LENGTH TERMINAL LOBE LENGTH AND BREADTH

Materials and methods

Populations of *Elytraria lyrata* Vahl grow in the Botanical Garden of the University of Ghana, Legon, and those of *E. minor*, through cultivation, have also been growing there for over three years. Four mature lobed leaves were selected at random from each plant and the parameters determined. Measurements of leaves were therefore taken from fifty plants in each of the species under consideration. The length of each

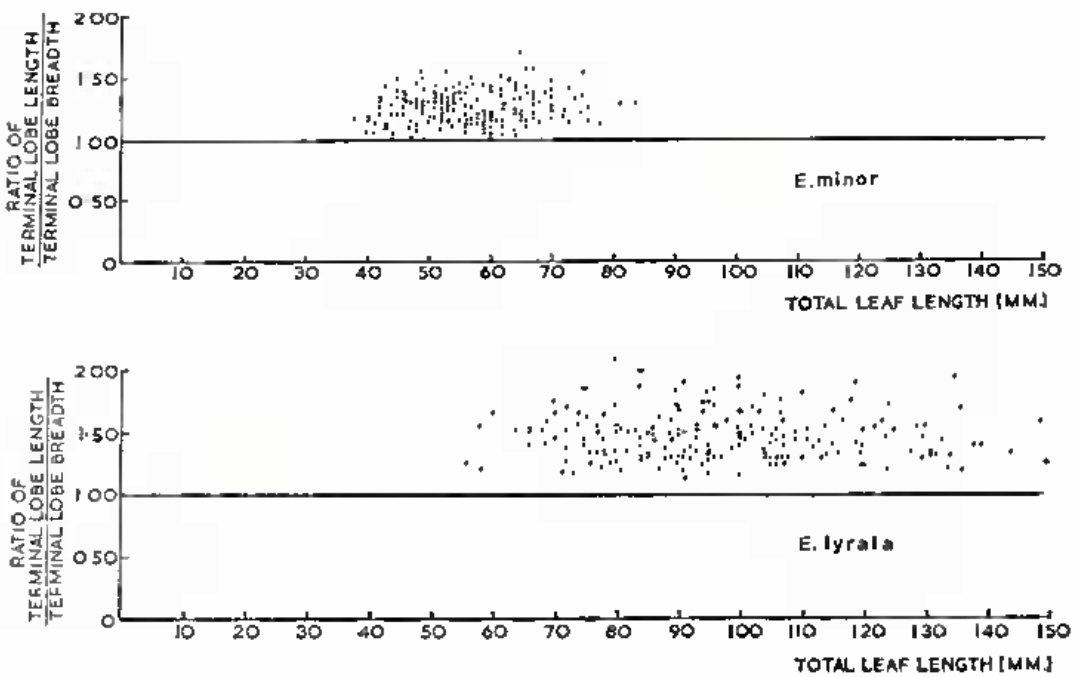
leaf was measured from the tip to the point of attachment of the petiole to the stem. The length of each terminal lobe was measured from the tip of the leaf to the deepest part of the sinus separating the terminal lobe from the one after it, and the breadth was measured at the broadest part of the terminal lobe. The prominent nerves were counted from the deepest part of the sinus mentioned above to the tip of the leaf. The statistical results are shown in table 1.

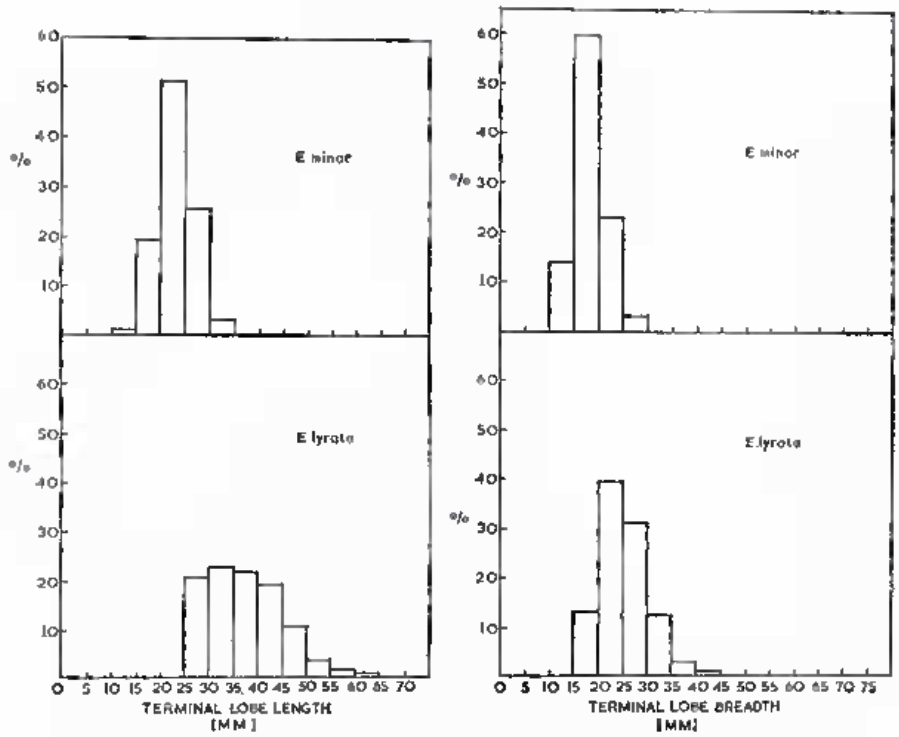
TABLE 1

LEAF MEASUREMENTS (mm); MEAN ± ONE STANDARD ERROR

SPECIES	TOTAL LENGTH MEAN	LENGTH OF TERMINAL LOBE MEAN	WIDTH OF TERMINAL LOBE MEAN	NUMBER OF LATERAL NERVES (BOTH SIDES) MEAN
E. minor . .	56.7 ± 0.906	23.7 ± 0.375	18.9 ± 0.302	5.5 ± 0.106
E. lyrata . .	97.0 ± 1.743	38.9 ± 0.829	26.3 ± 0.454	11.4 ± 0.224
	$t = 19.018$, 229 d.f $P < .001$	$t = 16.504$, 205 d.f $P < .001$	$t = 13.13$, 218 d.f $P < .001$	$t = 23.425$, 207 d.f $P < .001$

In each case the differences between the species were highly significant $P < 0.001$.





The author was given the opportunity to visit the Botanical Museum and Herbarium of Copenhagen University where VAHL's type specimen of *E. lyrata* Vahl was examined and photographed.

My trip to examine VAHL's type specimen ended in Kew Herbarium, London, where, with the permission of the Director, I had the opportunity to examine all the specimens of the species of *Elytraria* received from different parts of the world.

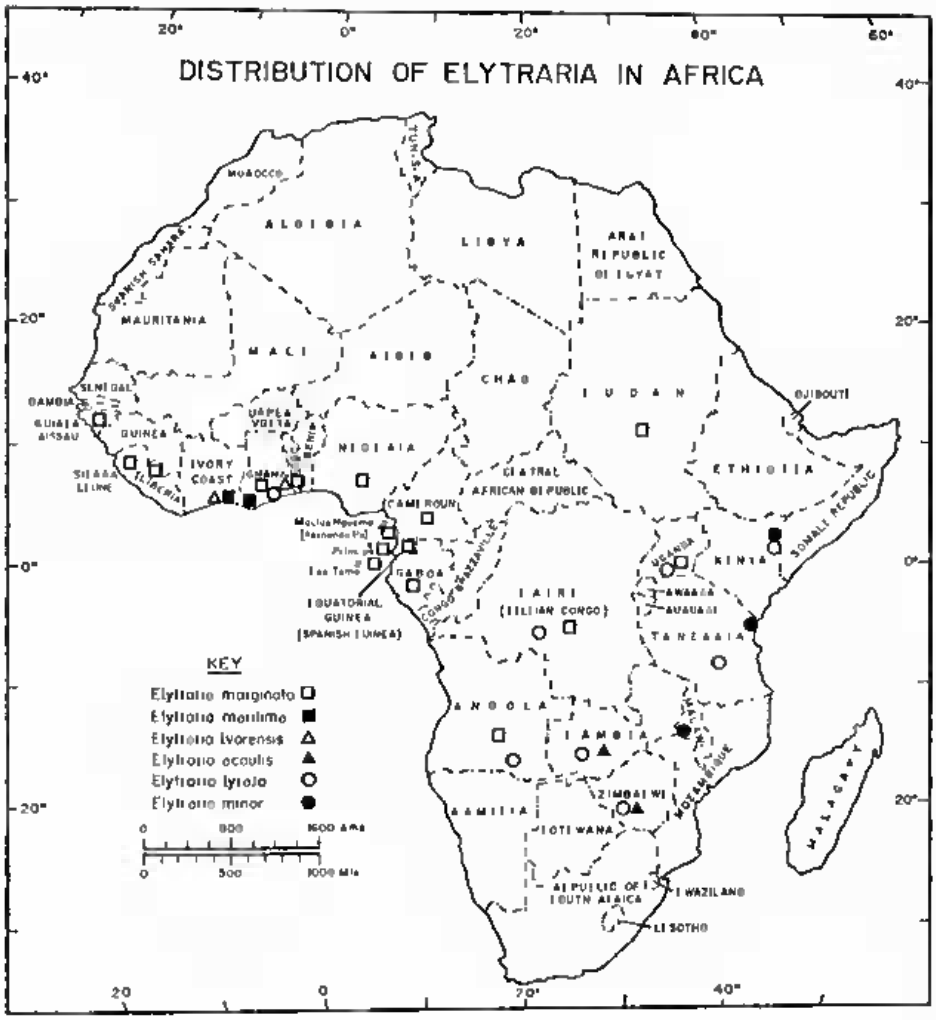
A key to the five species of *Elytraria* under observation, based on habit, can be established :

1. Plant acaulous.
   2. Leaves obovate, subentire margin, pubescent above, glabrous below ..... *E. ivorensis*
   2′. Leaves lyrate.
      3. Leaves flat, terminal lobe longer than broad, 4-8-nerved, lateral lobes prominent; fruit not spreading..... *E. lyrata*
      3′. Leaves bullate, terminal lobe suborbicular, 3-4-nerved; fruit spreading ..... *E. minor*

1′. Plant caulescent.
   4. Main stem 4-20 cm in height, erect, sparingly branched; leaves spathulate ..... *E. marginota*
   4′. Main stem 2-3 cm in height, much branched, prostrate, creeping; leaves broadly elliptic..... *E. maritima*

I have identified the following specimens from East Africa as **Elytraria minor** Dokosi :

KENYA : *Greenway & Rawlins 9366*, Mambasasa, Utwani Forest Reserve in semi-deciduous forest (type); *Magogo & Glover 631*, Shimba Hills, Sheldrick's Falls, riverine



forest on rocks under falls; *Napper 1382*, Kwale District, Buda Forest Reserve; *Rawlins 34*, Witu District, Utwani Forest, restricted to areas of dense shade in *Manilkara* forest with *Rinorea* under-storey; *Verdcourt 2131*, Mambasasa, in forest.

TANZANIA : *Drummond & Hemsley 3508*, 5 miles SE of Ngomeni; *Harris 3146*, Mile 60 W of Dar-es-Salaam; *Jeffery in K 338*, Amani, Sokeke; *Milne-Redhead & Taylor 7360*, Turiani, in riverine forest.

I have identified the following specimens as **Elytraria lyrata** Vahl, which also occurs in Kenya and Tanzania :

KENYA : *Bally 2080; Greenway & Rawlins 9460*, Lamu District; *Magogo & Glover K7'*, Kwale District.

TANZANIA : *Milne-Redhead & Taylor 7561*, Lindi District.

DISTRIBUTION OF THE SPECIES OF *ELYTRARIA* IN AFRICA :

Elytraria lyrata Vahl : Ghana, Zaïre, Angola, Tanzania, Uganda, Kenya, Malawi, Zambia and Zimbabwe.

Elytraria marginata Vahl : Sierra Leone, Liberia, Ghana, Togo, Nigeria, Cameroun, Fernando Po, Sao Tome, Principe, Equatorial Guinea, Gabon, Zaïre, Angola, Sudan and Uganda.

Elytraria maritima Morton : Ivory Coast, Ghana.

Elytraria minor Dokosi : Kenya, Tanzania.

Elytraria ivorensis Dokosi : Ivory Coast, Ghana.

Elytraria acaulis (L. f.) Lindau : Zambia, Zimbabwe.

ACKNOWLEDGEMENTS : I should like to render my most grateful thanks to J. C. BOWLING for sending me seeds of this species collected from East Africa and cultivated in Kew Botanical Gardens. My sincere thanks are also due to the Curator of the East African Herbarium, Kenya and the Deputy Director of the Central National Herbarium, Howrah, India, for sending me their herbarium specimens for examination.

I am also grateful to Dr. POLHILL who kindly sent me a xeroxed copy of Miss NAPPER's unpublished account on this genus. My thanks are also due to Mrs. LIEBERMAN, Dr. LOCK and HALL of this department for their advice in the course of this investigation and also to Mr. BOTOKRO who took care of the cultivated plants.

To the Chairman of C.S.I.R. and the Managing Trustees of Valco Trust Fund who generously provided funds for the trip to carry out research outside Ghana, I render my sincere thanks.

I am deeply indebted to the Director and staff of Botanical Museum and Herbarium of Copenhagen University for giving me all the required facilities in the University.

Finally I render my sincere thanks to the Director of Kew Herbarium for permitting me to examine the herbarium specimens of the genus *Elytraria* received from all parts of the world.

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